GPM/TRMM data reading program guide (THOR version)

2021/12/06

5th ed.

This document describes how to use the THOR tool to read and display images from the Global Precipitation Measurement Satellite (GPM/TRMM).

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Introduction

This document explains how to read GPM/TRMM data using a tool (THOR) that does not require programming.
In addition to THOR, there are other methods to read GPM/TRMM data as shown in Table 1.1. To determine which method to use, please refer to the following "Read Method Judgment Flow" below.
Table 1.2 lists the operating systems on which the sample programs used in this document were tested.

Table 1.1 GPM data loading methods

	Data loading method	Name of material	remarks
1	Using THOR	GPM/TRMM Data Loading Program Guide (THOR Edition)	
2	Use IDL	GPM/TRMM Data Loading Program Guide (IDL version)	
3	Use C	GPM/TRMM Data Loading Program Guide (C language version)	
4	Using FORTRAN	GPM/TRMM Data Loading Program Guide (FORTRAN Edition)	
5	Using Python	GPM/TRMM data reading program guide (Python version)	

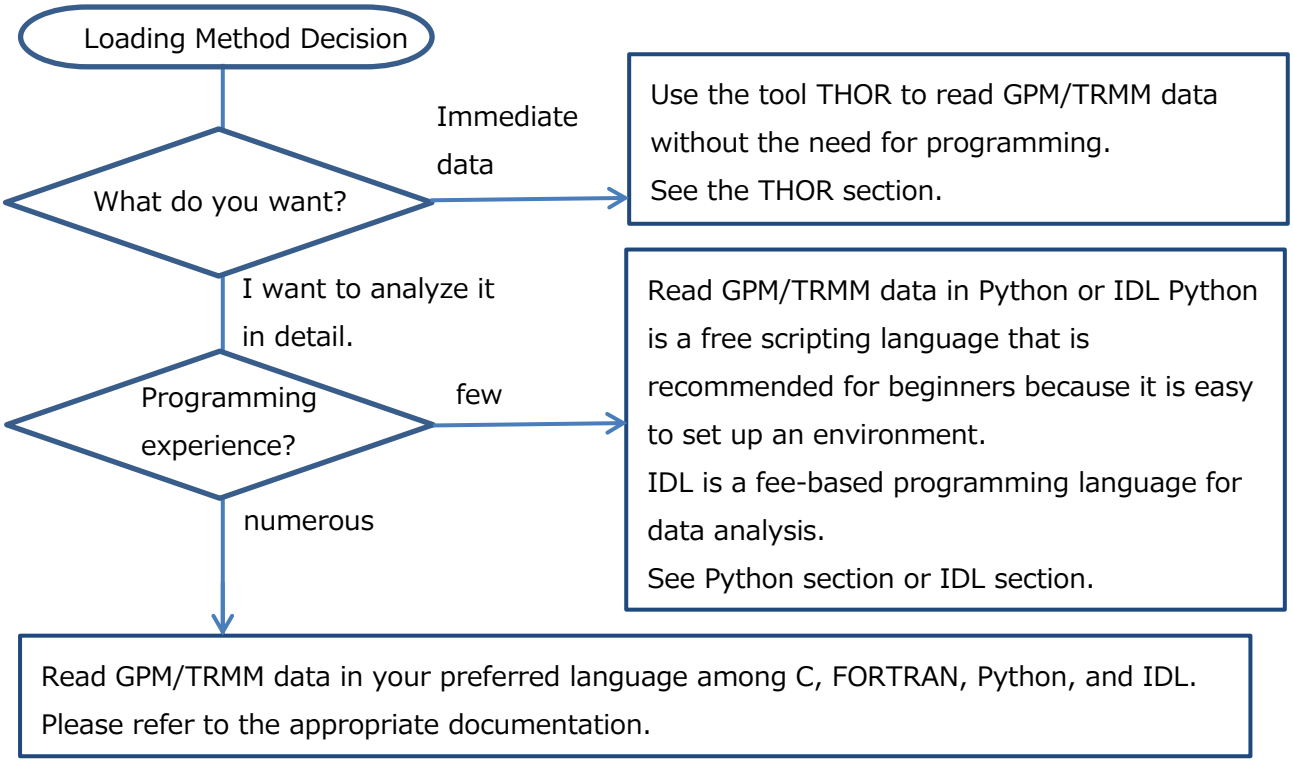


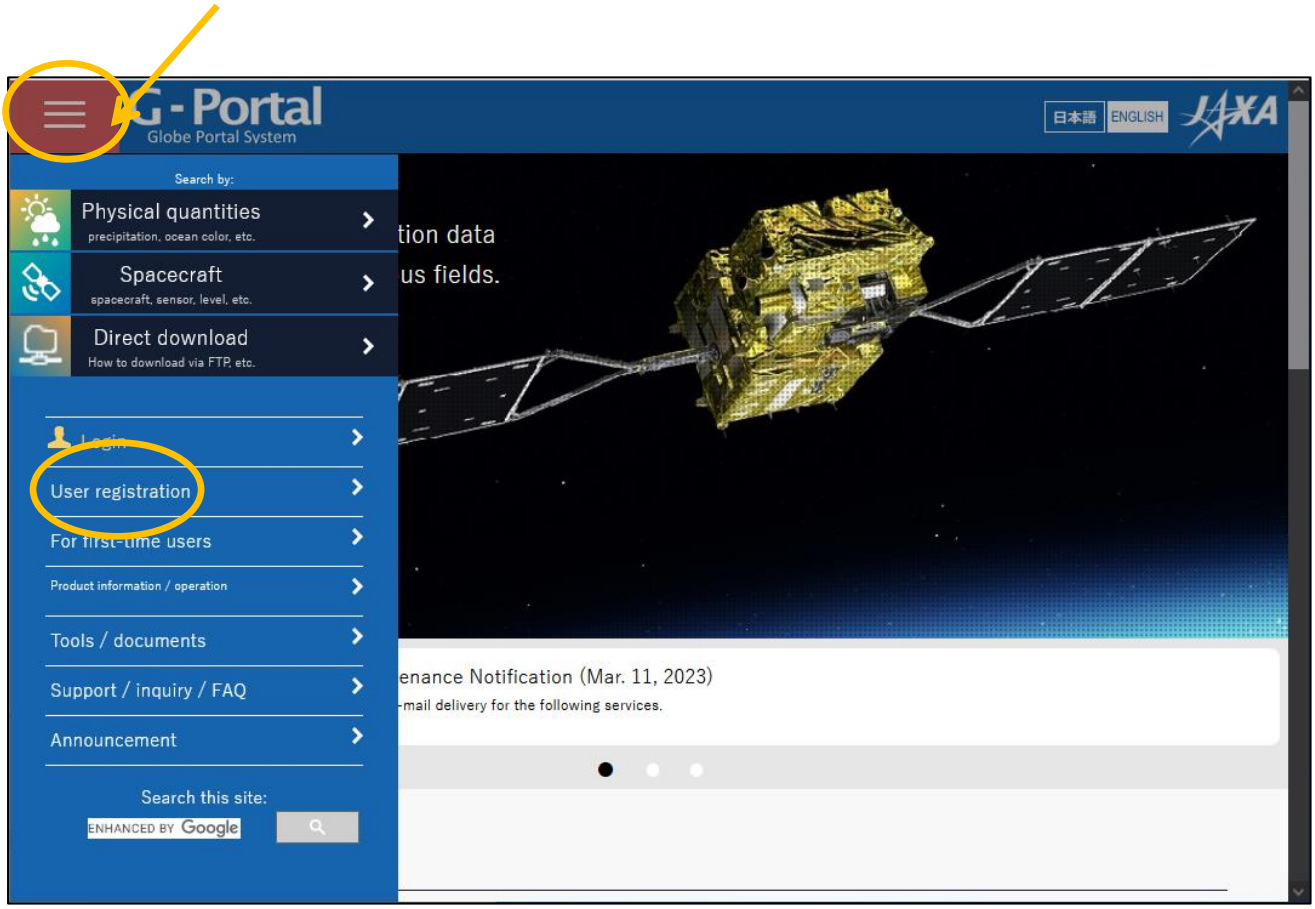
Table 1.2 Sample Program Operation Check Table

	sample program	Linux	Windows	remarks
1	c	○	-	
2	Fortran	○	-	
3	Python	○	○	
4	IDL	○	○	

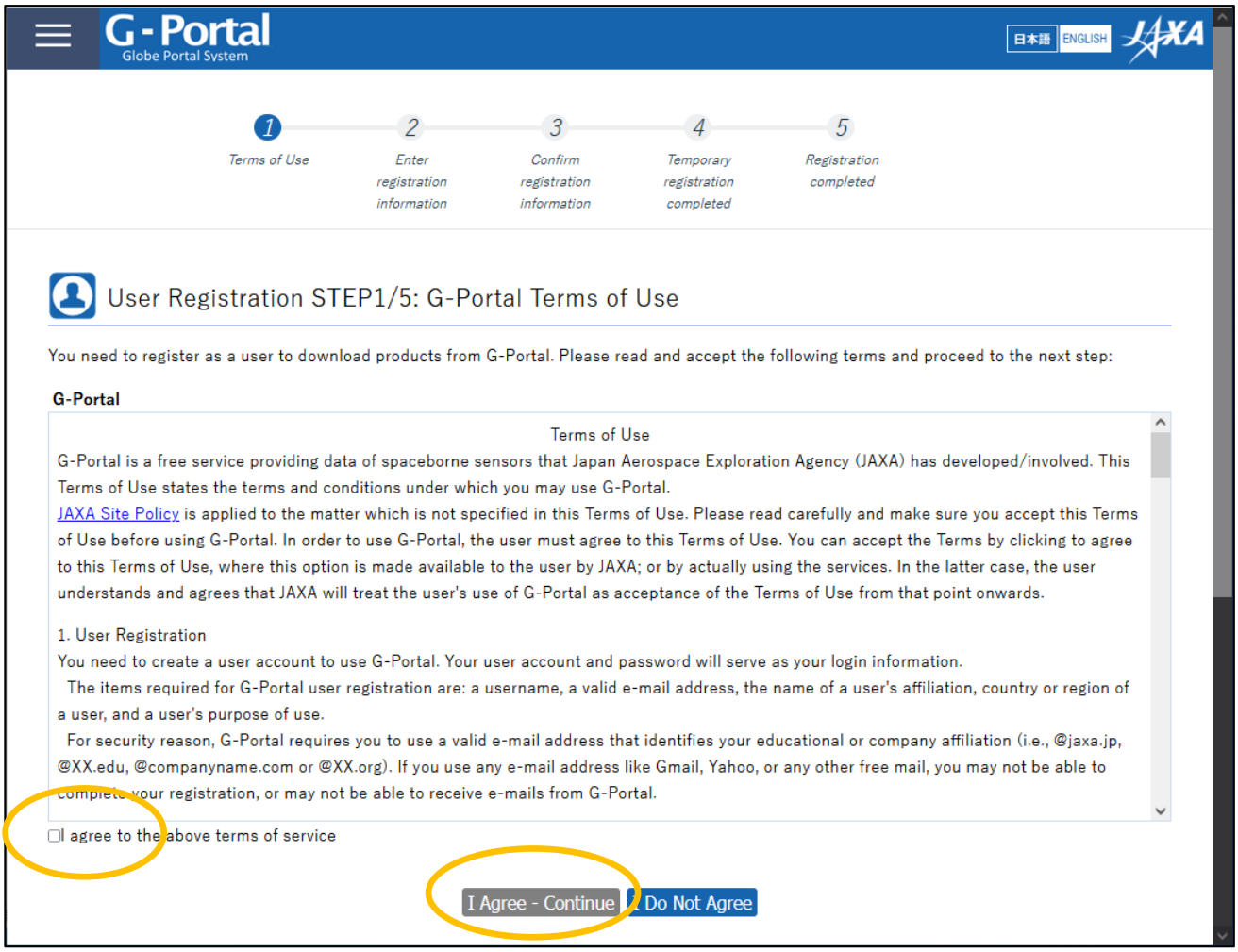
○ : Operation is confirmed. －: Operation is unconfirmed.

2. how to obtain GPM/TRMM data

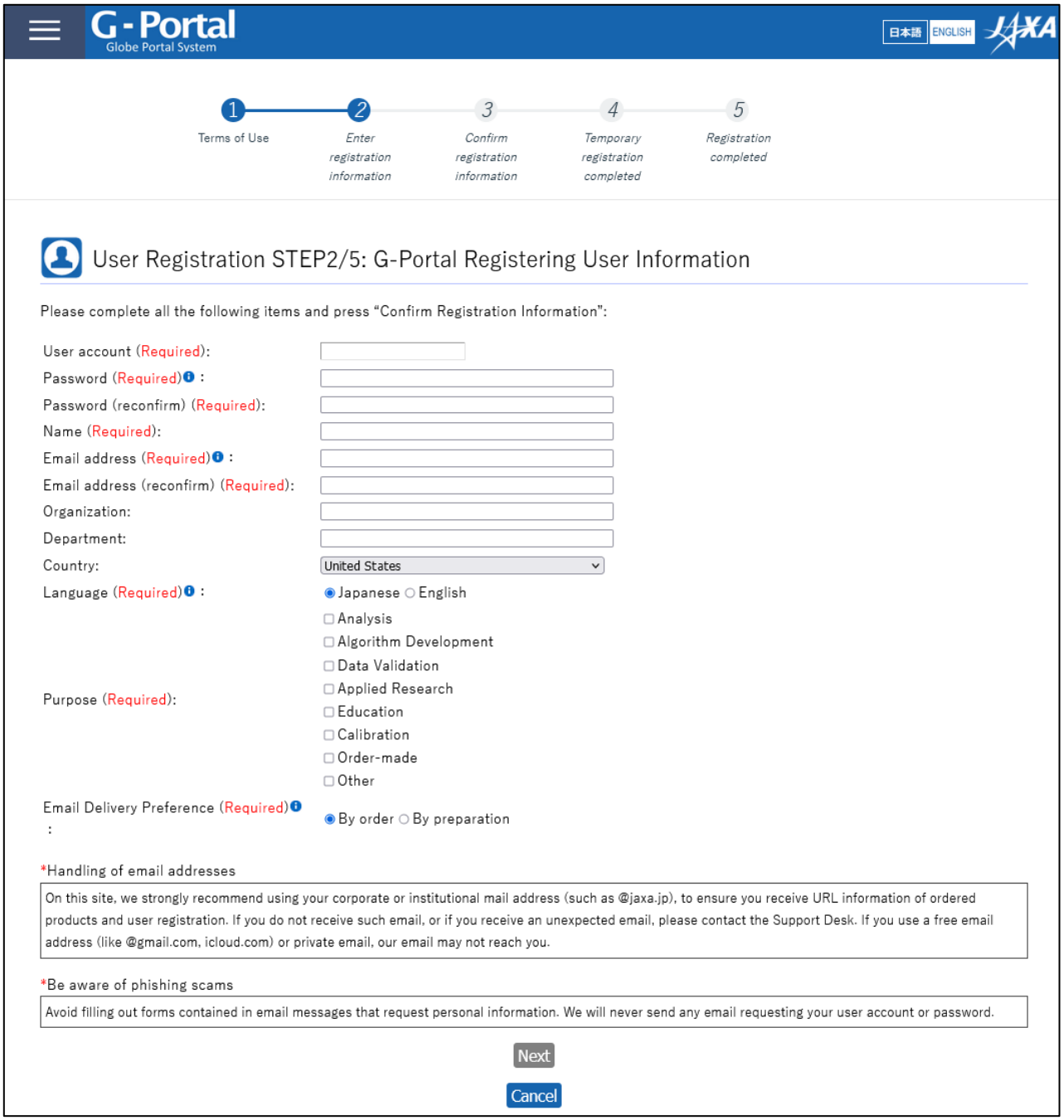
GPM/TRMM data can be obtained from the G-Portal site (https://www.gportal.jaxa.jp/gp/top.html). User registration is required to obtain the data. Please select "User Registration/Terms of Use" from the menu at the top of the G-Portal site to register as a user.



Read the terms and conditions and click "Agree and Next.



You will be taken to the user registration screen.



For the subsequent procedures and how to obtain data after user registration, please refer to "5.2 How to Use the Data Providing Service" in the "GPM Data Users Handbook". For information on how to obtain the "GPM Data Users Handbook," please refer to "3.

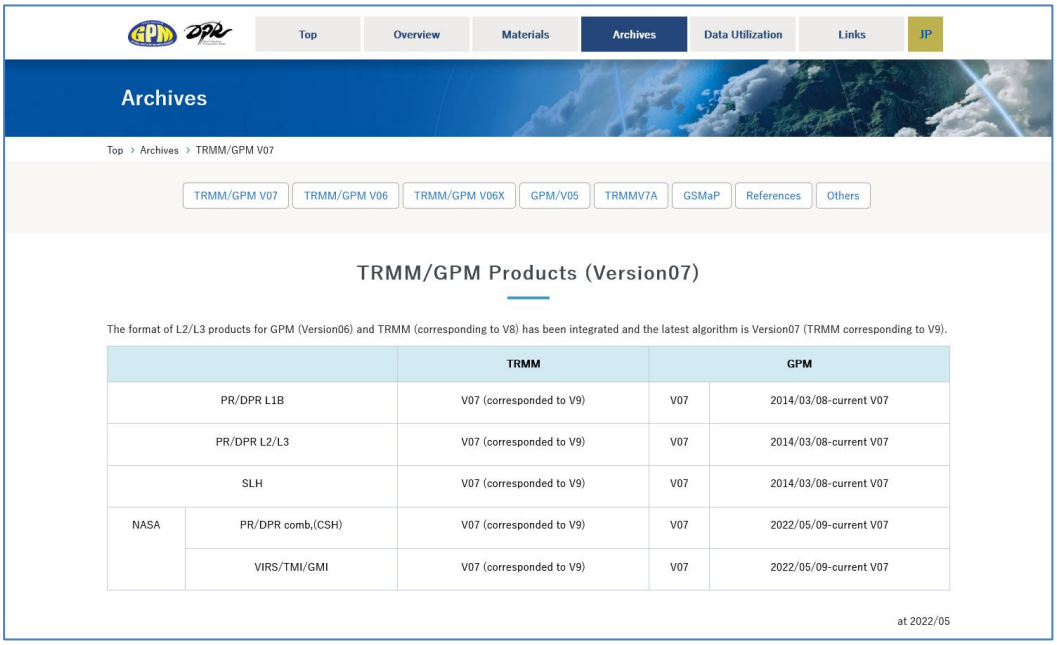
3. how to obtain related documents and sample programs

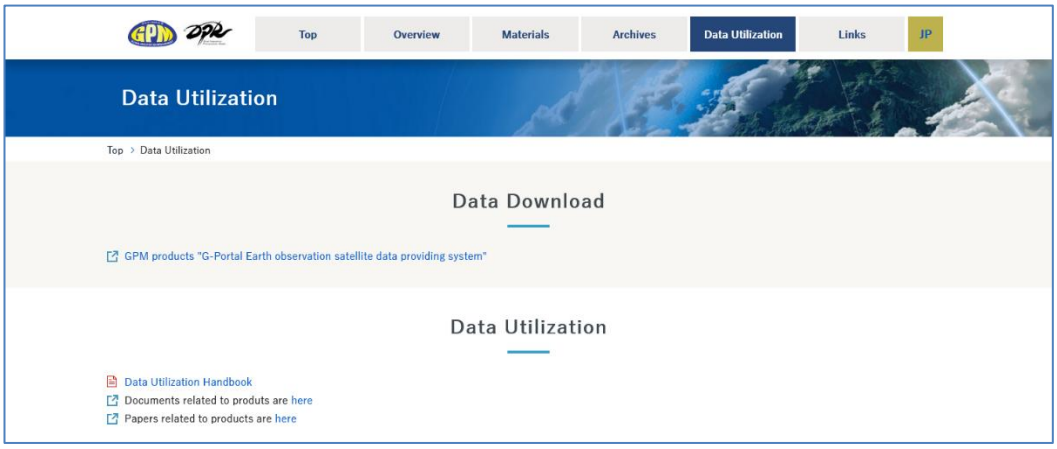
There are two documents related to GPM data: the GPM Data Use Document and the Product Document. Both documents can be downloaded from the Global Precipitation Measurement (GPM) website (https://www.eorc.jaxa.jp/GPM/index.html). You can also download the sample codes described in this document from Top Page > Data Utilization

Documentation for GPM data use includes

GPM Data Application Handbook

file naming convention





Click "TRMM/GPM V07" to see the list of documents for product version 07.

4. installation of library tools

To read GPM data in THOR, THOR must be installed as shown in Table 4.1.

Table 4.1 GPM data readout method

	GPM data readout method	Required libraries, tools	remarks
1	THOR	THOR	

This manual has been tested in the following environments

Table 4.2 Operating Environment

(data) item	environment
calculator	Intel(R) Xeon(R) CPU ES-2665 2.4GHz
OS	Red Hat Enterprise Linux Server release 6.4
THOR	THOR 2.2.007

4.1 Installation of THOR

THOR is a tool that reads GPM's HDF5 file and displays it as an image. It also allows you to check the value of each data stored in the HDF5 file without creating a program.

THOR can run on MAC/Linux/Windows.

4.1.1 Download

Download the appropriate compressed file for your environment from the following URL

https://gpmweb2https.pps.eosdis.nasa.gov/pub/THOR/

*The following description assumes you have downloaded THOR_2_2_linux.zip.

4.1.2 Decompression

Extract the compressed file in an appropriate working directory.

You can decompress it with the following command

$ unzip THOR_2_2_linux.zip

4.1.3 Installation of THOR

After unzipping, a directory named orbit is created.

Go to the orbit directory and run setupUNIX.sh.

$. /setupUNIX.sh

4.1.4 Starting THOR

Executing setupUNIX.sh will create a file named orbitUNIX.sh in the orbit directory. Running orbitUNIX.sh will start THOR.

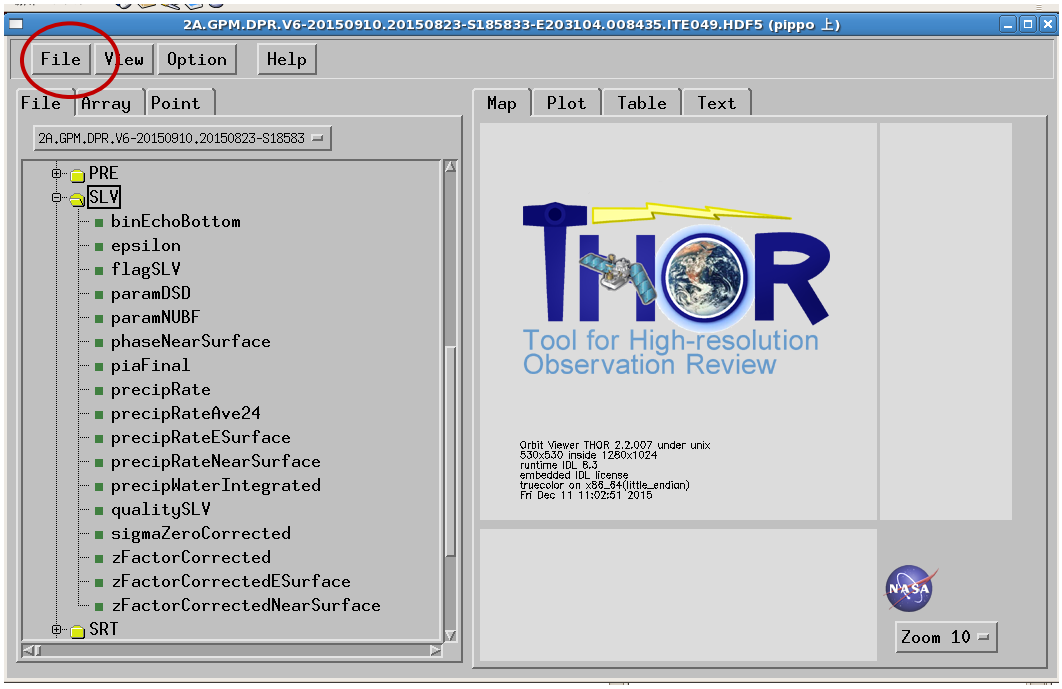
```
$ . /orbitUNIX.sh
```

For Windows, move the orbit folder directly under the C drive and run setupWin.bat in the orbit folder. This will create orbitWin.bat in the same folder. Double-click this orbitWin.bat to start THOR.

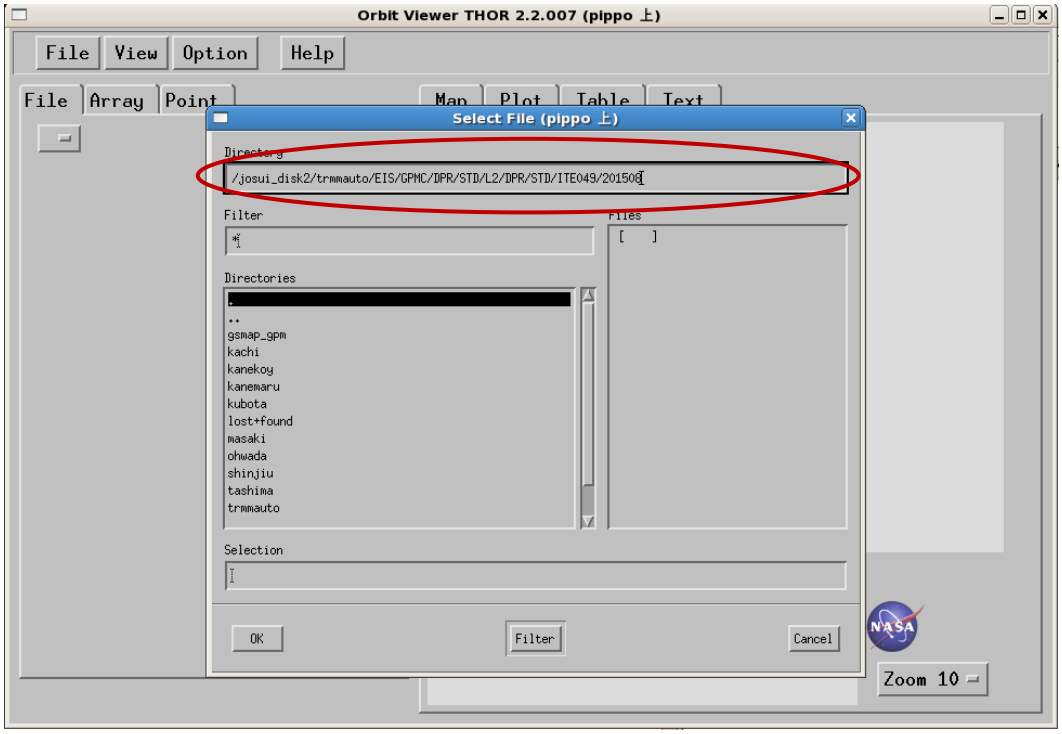
How to use PPS Viewer THOR

When THOR is started, the following screen appears.

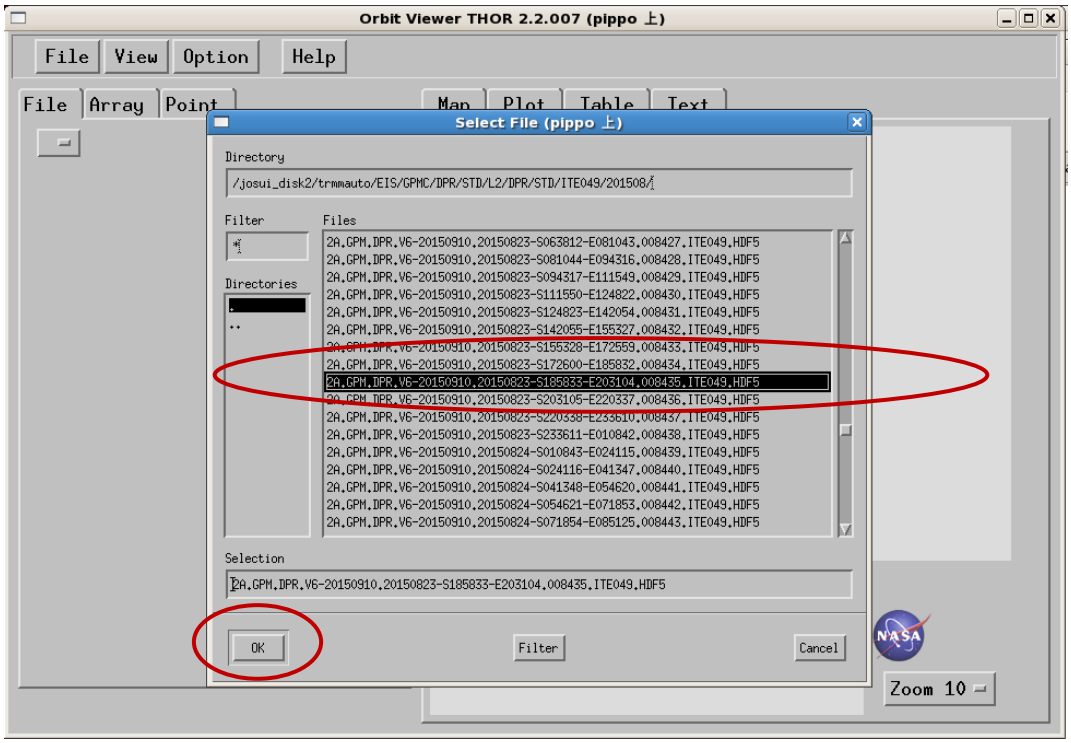
Click the File button to display the menu, then click Open in the menu.



A window for specifying the file will appear. Enter the path to the file to be read.



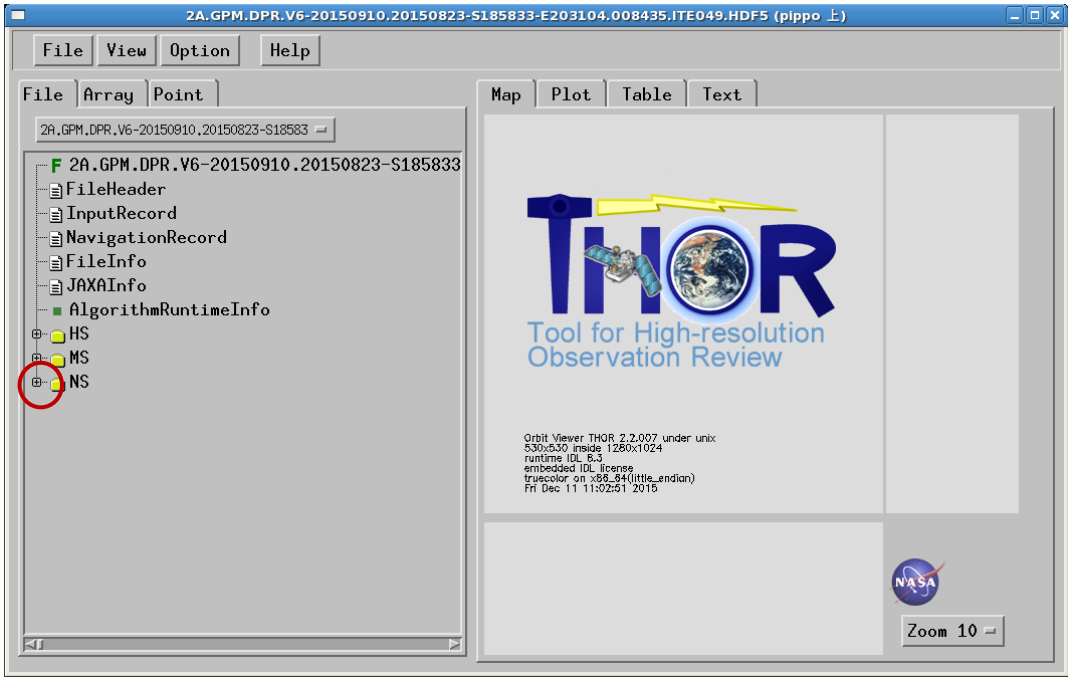
Specify the file to be read and click the OK button.



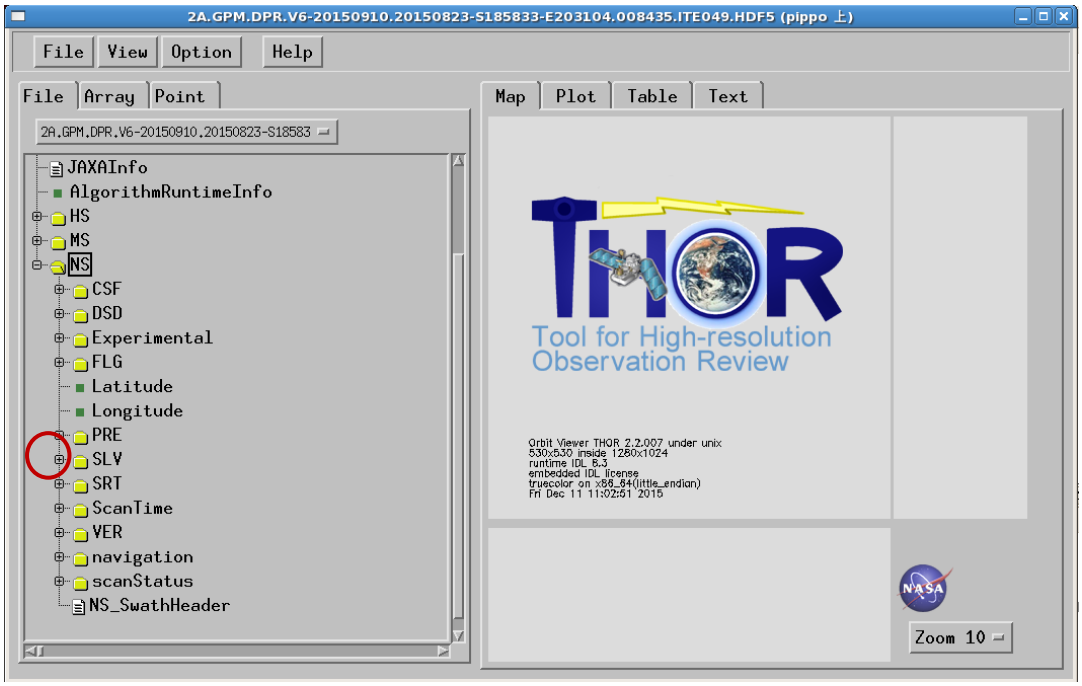
When the data is read, it is displayed as follows.

This section describes the operation to display NS.SLV.precipRateESurface (precipitation rate at the ground surface).

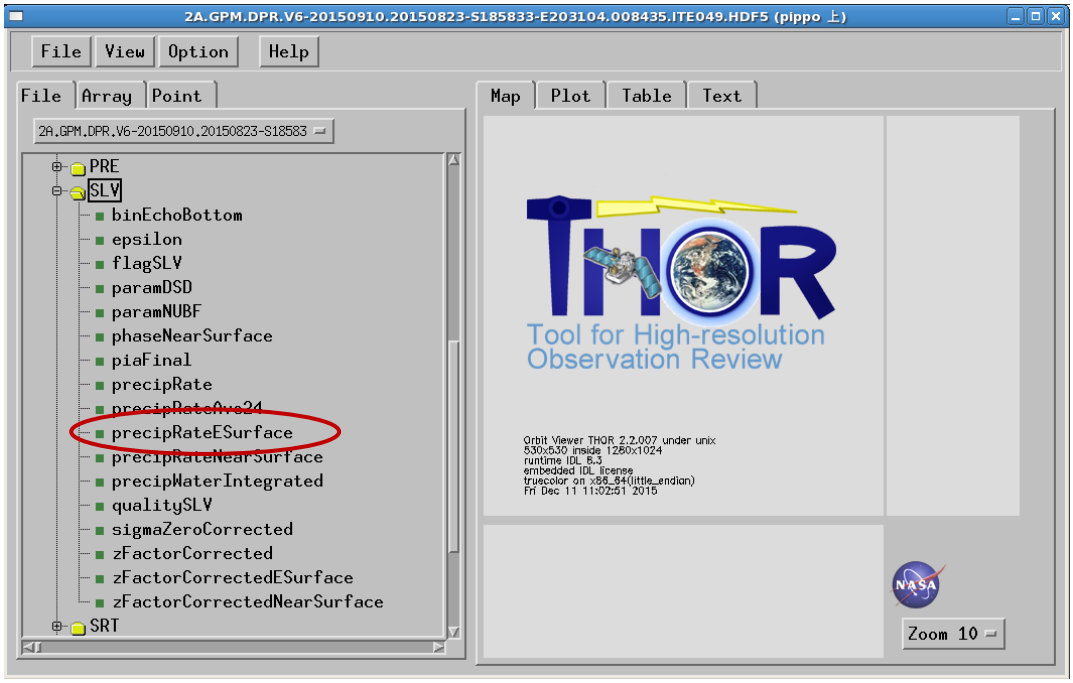
Click the [+] in front of the NS folder.



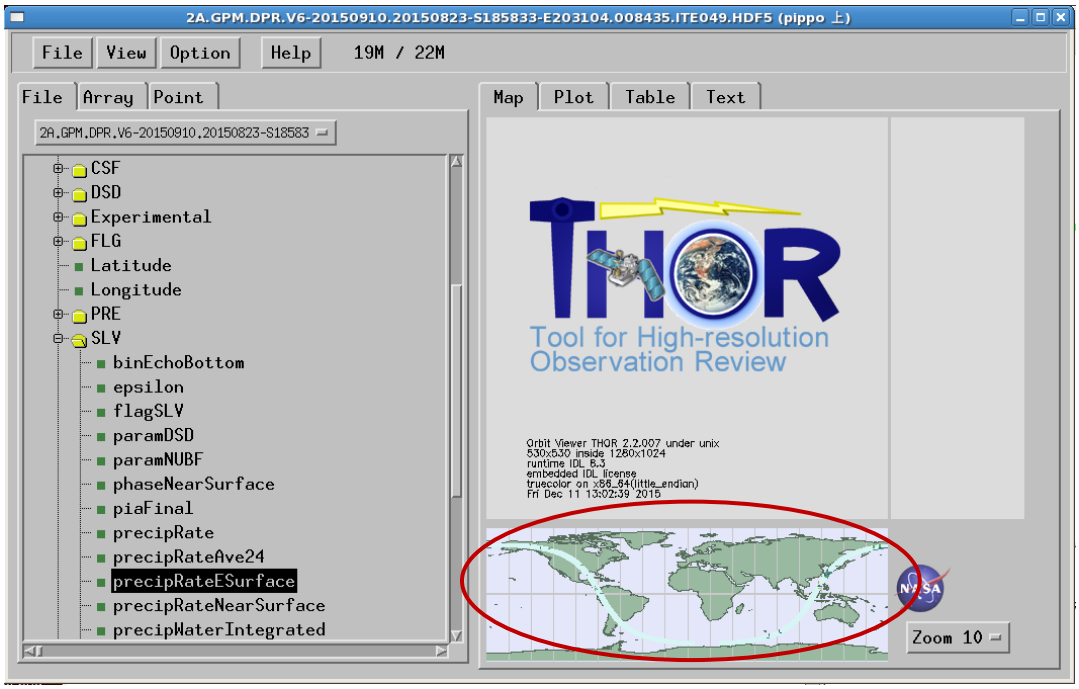
Since the data to be read is in the SLV folder, click the [+] in front of the SLV folder.



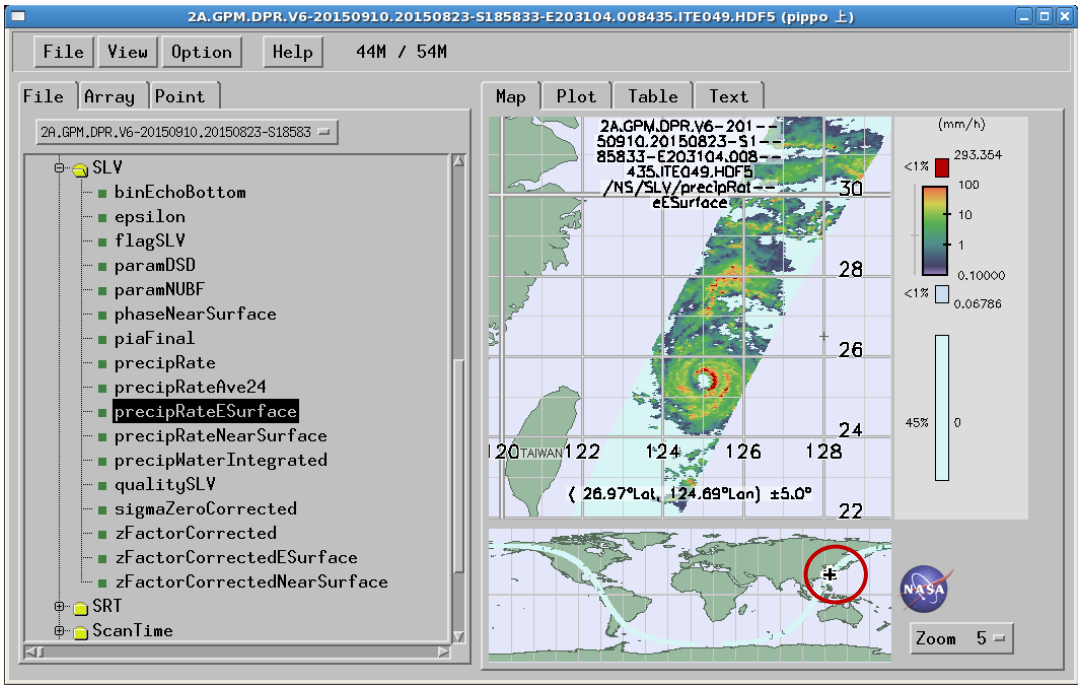
Click on the data precipRateESurface to read.



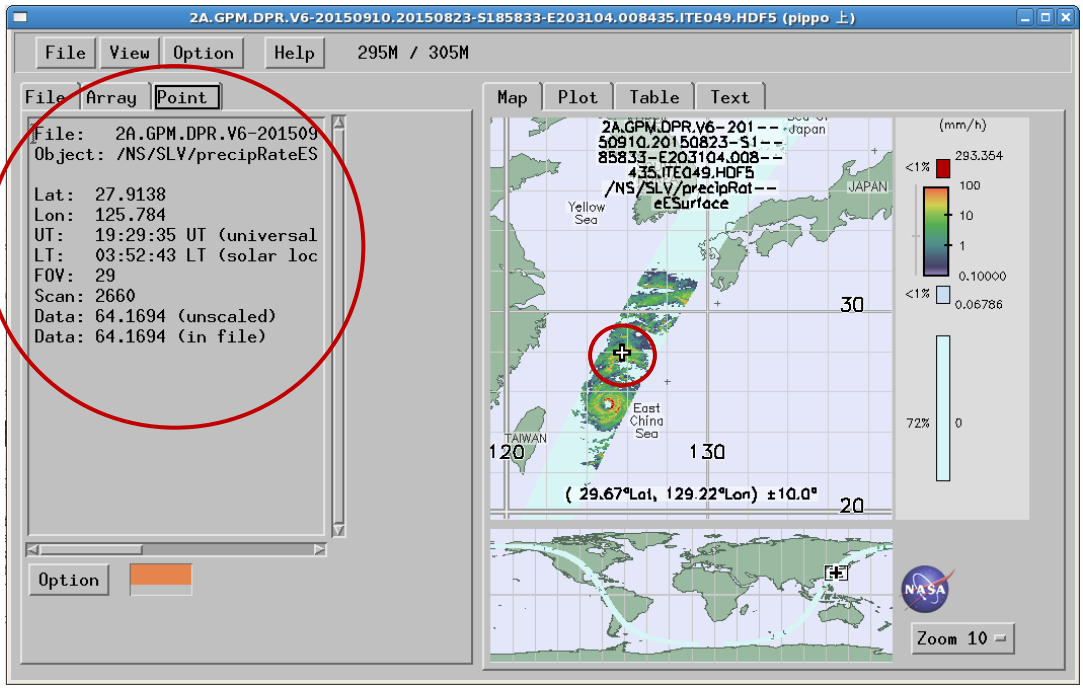
The orbit map will be displayed, and you can use the mouse to specify the location on the orbit that you want to display.



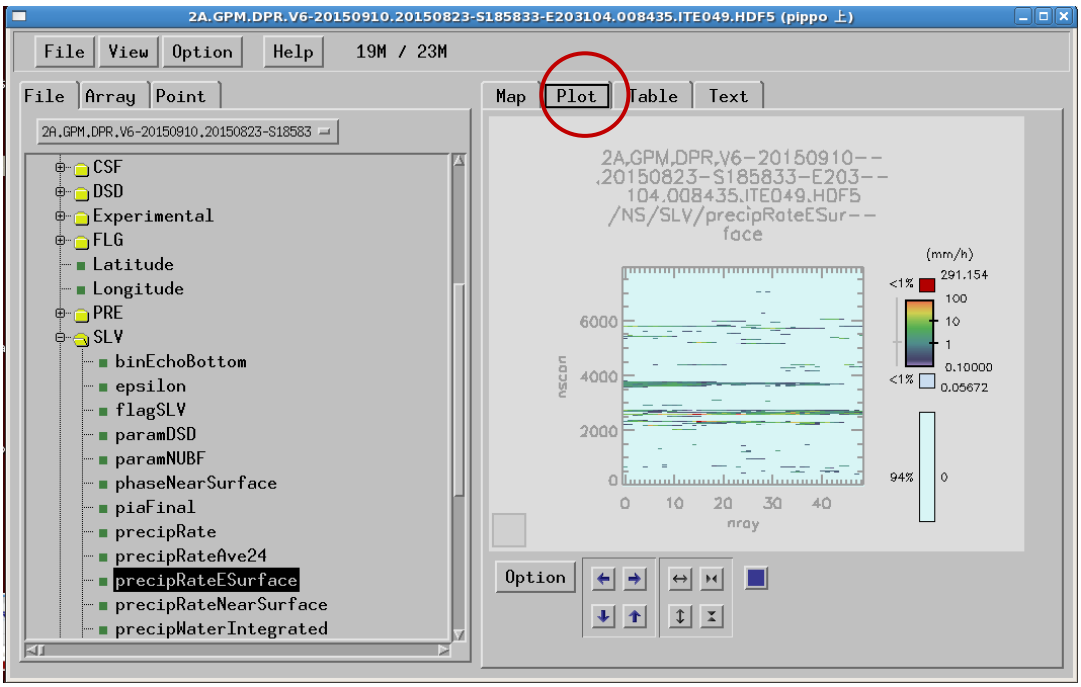
Clicking on a location on the orbit will display an image of that location, as shown below.



Clicking on the map shows its data values (in this case, surface precipitation intensity), location (latitude, longitude, scan number), date and time, etc.

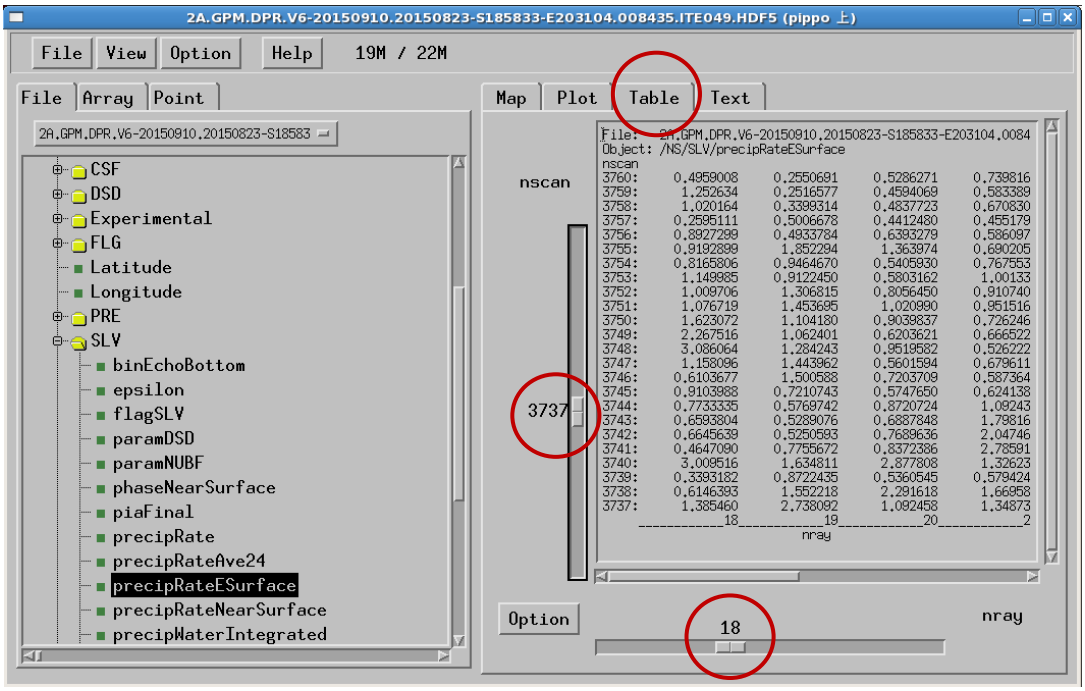


Let's look at the precipRateESurface data. First select the Plot tab.
The following figure is displayed, allowing you to see which parts of the scanned data are recorded. In the figure below, you can see that data is recorded around 2600 and 3600 on the vertical axis.



Next, select the Table tab. precipRateESurface data will be displayed.

Adjust the vertical and horizontal sliders to see the data.



revision history

version number	Date	Revised contents	remarks
1	2016/1/26		
2	2016/9/26	4.1 Installation of THOR: The procedure to execute setupUNIX.sh was missing, so it was added. Also, added description to execute setupWin.bat for windows version as well.	
3	2017/9/13	1. Introduction: python description added to Table 1.1, flowchart revised accordingly. Table 1.2 Sample code operation check table was added.	
4	4/17/2019	1.-3. Correction due to addition of TRMM and renewal of GPM site	
5	12/6/2021	3. revised availability of related documentation and sample programs 4. correction of URL for THOR download	